March 1964 Bulletin 433

Controlling Insects

of

Field Crops, Livestock, and Stored Grain

Do not use this bulletin after 1964. Use a new bulletin each year for up-to-date registered uses of insecticides.

Cooperative Extension Service
The Ohio State University

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To simplify information, trade names of products have been used. No endorsement is intended, nor is criticism implied of similar products not named.

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Controlling Insects

of Field Crops, Livestock, and Stored Grain

By

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General precautions in using insecticides: All insecticides require precautions in handling and use. Before using any insecticide **read the label** for precautions in handling and for directions in safe use for both yourself and the consumer. Much research has gone into the drafting of label directions, and they should be followed exactly. Use only on the crop or livestock specified, in the amount specified, and at the time specified.

> **Protect children, pets, bees, and wildlife from drift and vapors. Adjust nozzles to prevent mist from drifting to adjacent lawns and residential areas. Warn bee-keeping neighbors to remove, screen, or cover hives with wet burlap, and take the same precautions with your bees. Do not dump unused spray where run-off or seepage will contaminate fish-bearing waters.**

The insecticides recommended in this bulletin differ in their hazard to the user. Dangerous insecticides include phorate (thimet), parathion, demeton (systox), carbon tetrachloride, and ethylene dibromide. Moderately toxic insecticides include aldrin, DDT, diazinon, dieldrin, heptachlor, lindane, and toxaphene. In general, wise precautions in use include:

1. Do not smoke while using insecticide.
2. Do not breathe spray mist or dust.
3. Do not get in eyes, on skin, or clothing.
4. If spilled on skin or clothing, wash thoroughly with soap and water and clothes.
5. Bathe promptly after working with insecticides, and wash clothing with soap and water before re-use.
6. Wash hands and face thoroughly before partaking of food.
7. If specified on label, wear a respirator of type approved by the U. S. Dept. of Agriculture. Obtain this information from county Extension office.
8. Wear rubber gloves and freshly laundered, protective clothing.
9. Burn or destroy empty containers of highly toxic insecticides, and stay out of the smoke.
10. Keep out of reach of children.

11. Call a physician at once in all cases of suspected poisoning. Atropine is antidotal for some organophosphorous insecticides, but is an extremely dangerous drug that should be taken only as advised by a physician.

Insect Control Recomendations

In the following recommendations, the amount of insecticide per acre refers to active ingredient. For example, 1½ lbs. of DDT per acre is equivalent to 3 lbs. of 50% DDT wettable powder, or 3 quarts DDT emulsion concentrate.

CROP	INSECT	CONTROL
CORN (Field)	*Seed corn maggot*	Presence of insecticide may reduce number of seeds which must be planted. If treated seed is used, check the planter and adjust it to obtain the desired planting rate. Treat seed with lindane 4 oz. 25% per bushel within 21 days before planting, or use dieldrin 2 oz. 25% per bushel, or heptachlor 2 oz. 25% per bushel, or aldrin 2 oz. 50% per bushel. *Do not* use treated seed for food or feed.
	Wireworms *White grubs*	Treat only those fields with a history of wireworm damage. **A broadcast application should give control for two complete growing seasons.** Use 3 lbs. actual (emulsion concentrate or granules) aldrin or heptachlor **broadcast** just **before** planting and disc in **or** 1 lb. actual of either material applied at plant-time by in-the-row method. (Insecticide should be ½ to 1 inch above seed and not in direct contact.)
	Corn rootworm	Rootworms are the larvae of beetles that burrow in corn roots. There are two species in Ohio: the northern corn rootworm adult is a small beetle with pale green shells; the southern corn rootworm adult (also called the spotted cucumber beetle) has conspicuous black spots on green shells. Northern corn rootworms buildup in fields where corn is planted year after year. The cheapest means of controlling **northern corn rootworm** is by **rotation.** Use a crop other than corn for two successive years out of every four-year rotation. Where rotation is not feasible, use aldrin or heptachlor as recommended for wireworms. In fields where aldrin or heptachlor has not given satisfactory control, use 1 lb. actual diazinon (granules) in-the-row at planting time. Thimet (granules) can be used at the rate of 1 lb. actual per acre in furrow as a band at planting time. The

CROP	INSECT	CONTROL
CORN *(Cont'd)*	*Corn rootworm (Cont'd)*	granules should be ½ to 1 inch above seed and not in direct contact. Rootworms develop resistance through repeated exposure to aldrin and heptachlor. You can cause resistant rootworms on your land by the unnecessary use of aldrin or heptachlor on an insurance basis. Probably no more than 5% to 10% of Ohio corn fields will benefit from soil insecticide use. Use a soil insecticide only in fields that show some economic loss, when there is no choice but to use insecticide. **Southern corn rootworms** cannot be controlled by rotation. It is necessary to use insecticides as above.
	Cutworms (Below ground feeding species)	Use a **broadcast** application of aldrin or heptachlor as recommended for wireworms. An in-the-row application of a soil insecticide will **not** give satisfactory control. If infestation is causing damage after planting in fields not treated with a broadcast soil treatment, and if worms are near the soil surface and less than one inch long, spray (directed toward the base of plants) with 2 lbs. of actual toxaphene. Some states have experienced good results with this treatment.
	Sod webworms	Use **broadcast** application of either aldrin or heptachlor (3 lbs. actual emulsion concentrate or granules). If worms are found damaging corn in fields not treated with a broadcast soil treatment, spray the plants with 2 lbs. actual toxaphene per acre. Some states have obtained good results with this method. Direct the spray toward base of the plants. If replanting is necessary, apply a broadcast treatment of aldrin or heptachlor just prior to planting and disc in.
	Billbugs	Same as for sod webworms (see above). All comments under sod webworms similarly apply to billbugs.
	Armyworms	Toxaphene 2 lbs. per acre (2⅔ pts. 60% emulsion concentrate), dieldrin ¼ lb. per acre (1⅓ pts. 18% emulsion concentrate), DDT 1½ lbs. per acre, or sevin 1½ lbs per acre. **Do not** feed forage treated with toxaphene to dairy animals or animals being finished for slaugh-

CROP	INSECT	CONTROL
CORN *(Cont'd)*	*Armyworms (Cont'd)*	ter. **Do not** use dieldrin within 60 days of harvest or cutting for ensilage.
	Cutworms (Above ground species)	Prevent by fall or winter plowing or spray with toxaphene 2 lbs. per acre, dieldrin ¼ lb. per acre, or DDT 3 lbs. per acre; or bait using one of these insecticides.
	Corn borer	Select corn borer resistant hybrids K62, W64, C54, AES 805, or other hybrids claimed by breeder to be resistant. Plant as early as practicable. Insecticides usually not needed in field corn.
	Corn leaf aphid	The most dependable means of avoiding corn leaf aphid injury is to use **resistant hybrids** such as K62, W64, C54, AES 805, or other hybrids claimed by breeder to be resistant. Lack of proper equipment and **the need to time spray exactly** make insecticide much less dependable than use of resistant hybrids. Apply phorate (Thimet) 10 lbs. 10% granules, or spray with parathion ½ lb. per acre or malathion 1 lb. per acre in whorl prior to tasseling, *if* 1) 25% of plants are heavily infested, and *when* 2) Tassels are 25%-50% out (within one or two days after infestation appears), and *if* 3) Soil moisture is low. The above timing is critical. If the field is not sprayed within 48 hours after tassels are out of infested plants, the spray will generally not prevent injury because the damage will have been done. Use high clearance ground sprayer. Use 15-25 gallons of water per acre. Results with aircraft application have been variable, but should not be ruled out entirely.
	Silk beetles (Japanese beetles and corn rootworm adults)	Use 1½ lbs. DDT per acre (**do not** use plants for feed), ½ lb. dieldrin per acre (60-day limitation), or sevin 2 lbs. per acre. Beetles chew off the silks of corn at the ear tips, preventing pollination. If corn has pollinated, there is no need for control. Economic damage is most frequently found where late maturing hybrids are used, or in late planted corn.
	Grasshoppers	Aldrin 2-4 oz. per acre (30-day limitation), toxaphene 2 lbs. per acre (do not use plants for feed), or dieldrin 2 oz. per acre (40-day limitation).

CROP	INSECT	CONTROL
CORN *(Cont'd)*	*Chinch bugs*	Dieldrin ½ lb. per acre (60-day limitation) or toxaphene 3 lbs. per acre (**do not** use plants in feed).
	Common stalk borer	Chemical control not recommended. Clean up development areas such as ditch banks and fencerows. This is the only practical method of control.
LEGUMES	*Spittlebugs*	**Spring treatment** (for nymphs): (Use at least 10 gallons of spray per acre). Methoxychlor 1 lb. per acre one week after eggs hatch (7-day limitation in pasturing), or lindane 0.2 lb. per acre (20% emulsion concentrate). **Do not** graze or cut for forage within 30 days after treatment. **Fall treatment** (for adults): (Sept. 1-10) DDT 1½ lbs. per acre. **Do not** pasture for remainder of year. Use 10, or preferably 20, gallons of spray per acre.
	Alfalfa weevil	During the spring of 1963, infestations were found in many southeastern Ohio counties. The weevil is steadily spreading westward. Once the weevil is established, insecticide control is necessary in order to harvest the first growth. **The fall treatment is far superior to the spring treatment.** A fall treatment in 1964 will protect the spring growth in 1965. **Fall treatment:** Use 1 lb. actual dieldrin, or heptachlor as 2½% or 5% granules or as emulsion concentrate. Apply during the month of October. **Do not** harvest or pasture treated fields until time first cutting is usually made for hay the following spring. Emulsion concentrate should be used in 10 or more gallons of water per acre and on a still day with the boom low so that the soil surface will be completely covered. A dry mixture of insecticide and fertilizer is apt to separate and the result may be poor. **Spring treatment:** Use 1 lb. malathion or 1½ lbs. methoxychlor in 20 gallons of water per acre. Make first application when 50% of the plants show terminal feeding. Both chemicals will give protection for a period of one week. **Repeat** applications

CROP	INSECT	CONTROL
LEGUMES *(Cont'd)*	*Alfalfa weevil (Con't)*	may be needed. If large numbers of larvae are still present at time of first cutting, spray stubble to avoid injury to regrowth. **Do not** pasture or harvest within 7 days of application.
	Aphids (pea)	Pea aphids are sometimes a problem in early spring. Spray only if alfalfa loses its normal deep color or if wilting occurs and large numbers of green aphids are present. Use malathion 1 lb. per acre. **Do not** pasture or harvest within 7 days of application. Demeton (highly toxic) should be used by trained operator only at rate of 4 oz. actual per acre (21-day limitation).
	Clover leaf weevil	Methoxychlor 1 lb. per acre (7-day limitation).
	Leafhoppers	Methoxychlor ¾ lb. per acre (10 gallons of spray per acre) 10 to 14 days after first cutting (7-day limitation).
	Sweet clover weevil	DDT 2 lbs. as spray or as 20 lbs. of 10% granules per acre as soon as seedlings emerge, or dieldrin 10 lbs. 5% granules or spray ½ lb. per acre (1⅓ qts. 18% emulsion concentrate). **Do not** feed dieldrin or DDT-treated forage plants.
PROTECT BEES — do not use sevin during bloom. Use methoxychlor or malathion only in late afternoon or evening, if emergency bloom application is necessary.	*Armyworms*	For emergency use: Methoxychlor 1½ lbs. per acre, or malathion 1¼ lbs. per acre (7-day limitation), or sevin 2 lbs. per acre (no time limitation).
	Clover root borer	Aldrin ¾ lb. per acre mixed with fertilizer in band seeding.
	Grasshoppers	Aldrin ¼ lb. per acre, or malathion 1 lb. per acre, or naled (dibrom) ¾ lb. actual per acre. Watch new seeding closely and treat early while the grasshoppers are small **Do not** feed or pasture aldrin-treated hay. **Do not** pasture or feed malathion-treated hay for 7 days after treatment, or naled-treated hay for 4 days after treatment.
	Blister beetles	When beetles appear to be destroying 15% to 20% of the crop, then apply sevin 1 lb. (no day limitation), or methoxychlor 1 lb. (7-day limitation).
SMALL GRAIN	*Hessian fly*	Observe safe sowing dates. Usually permanent from year to year. (Not necessary to observe for rye or winter barley). Plant recommended resistant varieties.

CROP	INSECT	CONTROL
SMALL GRAIN *(Cont'd)*	*Chinch bugs*	(See chinch bugs under field corn.)
	Armyworms	(See armyworms under field corn.) Use malathion on maturing grain (7-day limitation).
STORED GRAIN	*Weevils and "bran bugs"* (Empty bins)	Clean bin, then spray with methoxychlor 1 lb. 50% wettable powder in 2½ gallons of water, or malathion 1 pt. 57% emulsion concentrate in 3 gallons of water.
	Indian meal moth	Apply **premium grade** malathion 57% emulsion concentrate ½ pt. in 2 gallons of water per 1,000 square feet of grain surface. Apply evenly over surface immediately after grain is loaded into storage.
	Weevils and "bran bugs" (Grain protectant)	1% malathion-wheat flour dust, **premium grade,** at 60 lbs. per 1,000 bushels grain, or 1 pt. **premium grade malathion** 57% emulsion concentrate in 2 to 5 gallons of water per 1,000 bushels, or pyrethrum-synergist **wheat** protectant for **wheat**; pyrethrum-synergist **grain** protectant for other **grains.** Follow manufacturer's directions. *or* For infested grain in bin, **fumigate** with carbon tetrachloride-ethylene dichloride mixture or other fumigants according to manufacturer's directions. **Do not** use aluminum phosphide, or any inflammable or potentially explosive fumigant. It is wise to **read the fumigant label** before purchasing.

LIVESTOCK	INSECT	CONTROL
	Fly control in poultry houses	(1) **Sanitation:** Remove manure from beneath caged layers and scatter in the field to dry. This should be done every two weeks. If you cannot remove manure, control maggots by using one of the following drenches: (2) **Manure drenches:** **dimethoate** (cygon) 2 oz. of 50% emulsion concentrate in 3 gallons of oil or water; **or** **ronnel** (korlan) 4 oz. of 24% emulsion concentrate to 3 gallons of oil or water: **or** **malathion** 1 pint of 57% emulsion concentrate to 5 gallons of oil or water. It is **not** necessary to remove caged layers when using any of the above insecticides as a

Fly control in poultry houses (Cont'd)

manure drench. Spray lightly but evenly over manure. Oil is preferable as it penetrates, whereas too much water will puddle manure and increase fly problem.

(3) **As a residual wall spray:**
dimethoate (cygon) 1 qt. to 12½ gallons of water (First, remove birds from building.);

or

ronnel (korlan) 1 lb. 25% wettable powder to 3 gallons of water, or 1 pt. 24% emulsion concentrate to 3 gallons of water **(Birds do not need to be taken out of houses.)**;

or

malathion 1 pt. 57% emulsion concentrate, or 2 lbs. 25% wettable powder to 5 gallons of water (Not necessary to remove birds.).
Do not use diazinon or baytex in poultry houses.

(4) **Baits:**
Use bait containing dipterex, malathion, DD-VP, or naled (dibrom) in caged layer houses, but not where available to loose housed birds.

(5) **Foggers:**
Use at least 0.1% strength pyrethrins for day-to-day control of flies in closed poultry houses.

Fly control in dairy barns

(1) **Sanitation:** Sanitation is necessary for good fly control and to prevent resistance to insecticides.
- ... Spread manure and bedding in the fields by late March.
- ... If at all possible, spread manure and bedding in the field at least once a month during the summer.
- ... Maggots live in silage seepage areas, in feed lots, calf pens, wet straw stacks, old wet bales of hay, and grass clippings. Old straw and bales can be spread out. The other fly producers can be drenched with residual insecticide spray to kill maggots. It is best to use clean-up measures, however, instead of maggot drenches whenever possible, as flies quickly become resistant to insecticides used as maggot drenches.

(2) **Baits:** Baits are effective and cheap. Moist baits tend to be more attractive than dry baits. The use of bait in the barn at least once a week

Fly control in dairy barns (Cont'd)

gives fair fly control until stable flies buildup. The use of baits, however, in conjunction with a program for protecting dairy cows in pasture provides the least expensive control with minimum labor. Use baits containing **dipterex, malathion, DDVP,** and **naled (dibrom)** as the manufacturer directs. Dipterex lasts many days, the others but a day or two.

Treated fly cords and fly bands are also effective, as long as dust does not cover them.

DDVP impregnated plastic strips are effective in milkrooms or other enclosures with little air movement.

No bait should be used in such a way as to be a hazard to children or pets. For example, kittens may be poisoned if they eat flies killed by dipterex. **Baits may be used in milkrooms.**

(3) **Residual Sprays:** These are useful for spraying walls and for destroying maggots in infested manure, silage seepage areas, calf pens, hog pens.

. . . Spray walls to run-off point.

. . . Spray maggot-producing ground, manure, or litter with drenching amount.

Use a power sprayer or a good proportioner type sprayer (such as the Dow Proportioner Kit) used with an ordinary garden hose.

These residual insecticides are recommended in Ohio:

dimethoate (Cygon): Dimethoate is given a preferred recommendation because of the length of residual control (about 8 weeks) as well as completeness of control. Dimethoate may be used in dairy barns as well as beef, swine, sheep, or horse barns. **All animals,** however, **should be removed** first from the buildings.

Use 1 qt. (1 lb. actual dimethoate) to 12½ gallons of water. Spray to point of run-off. If a second spray is necessary in mid or late summer, use at the rate of 1 qt. to 25 gallons of water.

diazinon gives excellent control in most barns **Remove livestock** until insecticide dries. **Do not** use directly on animals. **Do not** contaminate water or feed.

LIVESTOCK	INSECT	CONTROL
	Fly control in dairy barns (Cont'd)	Use ½ pt. of 25% emulsion concentrate to about 3 gallons of water. One gallon covers about 500 square feet. **baytex:** Long lasting—2 to 4 fluid ounces per gallon of water. May be used in beef barns or hog houses, but **not** in dairy barns or poultry houses. Do **not** spray animals directly. **Remove** animals from building until insecticide dries. **ronnel** (korlan): One pound 25% wettable powder to 3 gallons of water, or one pint to 3 gallons of water. **Ronnel has the advantage of safety.** Animals **do not** need to be taken out of barns when spraying with ronnel, with the **exception** of dairy cows which should be removed. **malathion** 1 pint 57% emulsion concentrate or 2 pounds 25% wettable powder to 5 gallons of water. Do **not** spray dairy cattle; **remove** them from barn until spray dries. **methoxychlor** may be successful in buildings where it has **not** been used for several years. Follow manufacturer's directions. (4) **Barn Atomizers:** Use at least 0.1% strength pyrethrins or a combination of 0.25% DDVP and 0.03% pyrethrins. ... Atomizers can be used in most barns. The mist controls flies in the **barn. Daily use is necessary.**
DAIRY CATTLE	*Hornflies*	One heaping tablespoon (approximately 10 grams) 50% wettable powder methoxychlor per animal; or 3 tablespoons 5% malathion dust **after milking, or 5 hours before.** Rub in on neck, back, uppersides. **Repeat** at 2-week intervals if necessary. Ciodrin low volume application: Mix 4 tablespoons of ciodrin emulsion concentrate (1 lb. per gallon) per 1½ pts. of water (1% concentration). Use precision trombone hand sprayer to apply one ounce to back and sides of animal. Use only three times a week. Synergized pyrethrins stock sprays applied at 1 to 2 ounces daily as a mist spray. Avoid coarse droplets. 0.1% pyrethrins is preferred over lesser strengths.

LIVESTOCK	INSECT	CONTROL
DAIRY CATTLE *(Cont'd)*	*Face flies*	Use ciodrin low volume treatment (see Hornflies) with particular attention to forehead and back. No more than three applications per week. Use 0.5% DDVP sirup bait on the forehead, 1/6 ounce per cow per day. **Use every day.**
	Horse flies	0.1% pyrethrins. Apply 1 to 2 ounces per animal daily. Avoid coarse droplets that burn.
	Stable flies	Ciodrin low volume application (see Hornflies). Synergized pyrethrins (see Horse flies).
	Grubs	There is no good preventive treatment for dairy cattle. Rotenone is a revenge treatment after the damage has been done. Rotenone is used when warbles appear on the back. Scrub cows with 1.2 oz. of 5% rotenone powder plus 2 oz. of soap in 1 gallon of water. **Or,** spray with 7½ pounds 5% rotenone powder plus 2 pounds of wetting agent in 100 gallons of water.
	Lice	Rotenone 1 to 2 pounds of 5% wettable powder per 100 gallons of water as a spray, or 1% rotenone dust 4 oz. per cow rubbed all over.
	Mange mites (Chorioptic)	This is an emergency treatment: Use 3 qts. of 1 lb. per gallon ciodrin per 100 gallons of water. Use 1 gallon of dilute spray per mature cow. Use 2 applications 10 days apart. Spray must be thorough, applied to all parts of the body.
	Ticks	1.2 ounces of 5% rotenone wettable powder in 1 gallon of water. Spray animals thoroughly as needed.
BEEF CATTLE	*Hornflies*	**Backrubbers**—either home-made or purchased. Use oil solutions containing 5% DDT, 5% methoxychlor, 1.5% ronnel, or 5% toxaphene. 5% crag fly repellent added to DDT or methoxychlor prolongs the action. Place the backrubber in open and **not in shade. Renew insecticide at least once a week.** **Sprays:** Use sprays of 0.5% toxaphene (28-day limitation before slaughter), 0.5% methoxychlor (no day limitation), 0.25% co-ral (**do not** spray sick animals or calves under one month of age.

LIVESTOCK	INSECT	CONTROL
BEEF CATTLE *(Cont'd)*	*Hornflies (Cont'd)*	Use only specifically screened formulation. Use only 2 quarts of spray per animal (7 days). Use 0.5% malathion, or 1.0% ciodrin (dilute 1 gallon of 1 lb. per gallon ciodrin emulsion concentrate with 8 gallons of water) and spray 1 to 2 **pints** per animal. Apply these sprays once every three weeks.
	Face flies	1.0% ciodrin—2 pints of water dilution as for hornflies for each mature animal. **Repeat** every 2 or 3 weeks. Backrubbers, prepared as for Hornflies, will reduce face fly numbers. In large pastures two or more backrubbers must be located so cattle have constant access to at least one.
	Horse flies	0.1% synergized pyrethrins. Use 1 to 2 ounces per animal as mist in daily application.
	Stable flies	Use synergized pyrethrins treatment (see Horse flies), or 1.0% ciodrin—1 qt. of water dilution per mature animal, as under Hornflies.
	Lice	**Backrubbers** (as for hornflies). Set up in winter feed lots. Greatly reduce numbers of lice, but will not entirely eliminate them. **Sprays:** For better control, spray in late fall with 0.03% lindane (1 lb. lindane 25% wettable powder per 100 gallons of water). **Do not** spray calves under 3 months (30-day limitation), 0.5% toxaphene (28-day limitation), 0.25% co-ral (7 days), 0.5% malathion (no limitation), 0.25% ronnel (56-day limitation), or 0.5% methoxychlor (no limitation). Follow label directions.
	Grubs	No proof that grub control pays in Ohio. An exception may be grubby calves from west of the Mississippi brought in in October or November for feeding and sale the following January, February, or March. **Recommendations:** ruelene pour-on treatment (not after November 1); or co-ral pour-on treatment —apply no later than November; or ronnel boluses or co-ral spray during October or November, but not later. These three insecticides work through the animal's blood stream. Read label carefully to avoid probable bad side effects.

LIVESTOCK	INSECT	CONTROL
HOGS	*Mange*	Lindane 0.06% 2 lbs. 25% wettable powder in 100 gallons of water. (30-day limitation as a spray.)
	Lice	The hog mange spray (lindane, see above), 0.5% malathion, 0.5% methoxychlor, 0.5% DDT (30-day limitation), 0.5% ronnel (42-day limitation), 0.25% co-ral, or 0.5% toxaphene (28-day limitation). During cold weather 4 oz. of 1% lindane, dusted on 100 square feet of bedding, will also control lice. Hog oilers are also practical. (Do not expose swine to this treatment within 30 days of slaughter.) Follow manufacturer's directions for application. Hog oilers using insecticides as indicated under Hornflies of beef cattle will prevent build-up of lice.
SHEEP	*Scab*	**As a dip** (other methods **not** effective). 0.5% toxaphene (28-day limitation). **Use special livestock formulation only.**
	Ticks (keds)	The toxaphene scab dip controls ticks (keds). Sprinkler-can method: Use 24% ronnel (korlan) emulsion concentrate at 0.25% (one-half cupful per 3 gallons of water). Crowd 25 head in small pen, leave just enough room to push through sheep. Sprinkle 6 gallons spray over heads, necks, tops, and sides as you walk among sheep (average treatment equals 1 quart per sheep). (Follow label restrictions). **High pressure sprays recommended only soon after shearing.** Use dips and sprays according to the manufacturer's directions for DDT, malathion, methoxychlor, rotenone, and co-ral.
	Lice	Dip as for ticks (keds).
	Wool maggot (fly strike)	Toxaphene protects against fly strike. Protection period not certain.
POULTRY	*Lice*	Paint roosts with nicotine sulfate 40% or dust birds directly with 5% sevin dust. (**Do not** treat within 7 days of slaughter. **Do not** repeat within 4 weeks.) 4% malathion dust or 0.5% co-ral dust may also be applied directly to birds. Use 1 lb. of dust per 100 birds. Dust caged layers directly from beneath. **Or** use 4% malathion, 5% sevin, or 0.5% co-ral dust-box self-treatment (1 lb. of dust in a shallow box per 50 birds).

LIVESTOCK	INSECT	CONTROL
POULTRY *(Cont'd)*	*Chicken mites*	These hide on walls and roosts by day and feed on birds at night. Clean house. Paint roosts with 40% nicotine sulfate, or spray roosts and walls with 0.5% sevin spray, 0.25% co-ral, or 1% malathion. Birds may also be dusted directly as for lice, using malathion, sevin, or co-ral. **Do not** treat nest, litter, or eggs with sevin.
	Northern fowl mite	This pest may be introduced to flocks through infested pigeons or sparrows. Get rid of sparrow nests on or about the buildings. Northern fowl mites stay on birds all the time. Dust directly as for lice using sevin, co-ral, or malathion; or use co-ral, sevin, or malathion dust-box treatment. Roosters do not dust themselves, so catch and dust each one individually. Use a floor litter treatment of 1 lb. 4% malathion or 5% sevin to each 50 square feet of floor.
	Fleas and bedbugs	Use malathion or sevin as a spray on walls and roosts, using high pressure to penetrate crevices. **Do not** house birds in sevin-treated houses within 7 days of slaughter. Treat birds directly as for northern fowl mites.

PETS	INSECT	CONTROL
DOGS	*Fleas*	Dust dogs and sleeping quarters with 5% DDT, 5% sevin, or 4% malathion. Spray floors, rugs, etc., with 5% DDT solution.
	Ticks	Same as for fleas on animal itself. Dogs may be sprayed or dusted with 1% lindane. **Outdoors.:** Dust vegetation 10 feet either side of paths with 5%-10% DDT dust; or spray with DDT, toxaphene, chlordane, or dieldrin (40% emulsion concentrate) 3 qts. in 25 gallons of water per acre.
CATS	*Fleas*	Use either ¾% or 1% rotenone dust, 4% malathion dust, or 5% sevin dust. **Do not** treat kittens under 4 weeks of age.